

Amendment under 37 CFR 1.111
Reply to Office Action dated September 23, 2004
December 23, 2004

REMARKS

By this amendment, claims 1, 2, 6-8, 10, 14, 16 and 17 have been amended and claims 20-38 have been added to the application. Currently, claims 1-38 are pending in the application with claims 9 and 11-13 being currently withdrawn from consideration.

The indication that claims 4 and 5 are allowed is noted with appreciation.

Claim 10 was rejected under 35 USC 102(b) as being anticipated by Chiu et al. (U.S. Patent Application Publication No. 2001/0010449). This rejection is respectfully traversed in view of the amendments to the claims and the remarks below.

The present invention relates to a semiconductor device that can be used in a backlight of a liquid crystal display or a panel meter and also in an optical device. The present invention also discloses that it is possible to mount the semiconductor element on a sub mount substrate in a manner that will prevent the wires from breaking thereby ensuring a more reliable device.

Claim 10 has been amended to recite that the device includes "a first surface disposed outside of the recess and a

Amendment under 37 CFR 1.111
Reply to Office Action dated September 23, 2004
December 23, 2004

second surface disposed outside of and offset from the first surface" and "a sub-mount substrate disposed in the recess, wherein the semiconductor element being disposed on the sub-mount substrate and a conductive paste material is disposed between a conductive pattern formed on the sub-mount and the lead electrodes". These features are not shown or suggested by Chiu et al.

Chiu et al. disclose a light emitting diode having a submount 310, lead frame 316, reflector 330 and wires 318 as shown in Fig. 3. Also, Fig. 6 discloses an LED 600, submount 610, conductive traces 614, and soldering material 612a.

However, Chiu et al. do not disclose a first surface disposed outside of the recess and a second surface extending outwardly and offset from the first surface. Chiu et al. also do not disclose a conductive paste material that is disposed between a conductive pattern formed on the sub-mount substrate and the lead electrodes. Therefore, Chiu et al. cannot achieve the benefits of the present invention and applicant respectfully submits that claim 10 now patentably defines over Chiu et al. Accordingly, it is respectfully requested that the rejection of claim 10 be withdrawn and this claim be allowed in response to

Amendment under 37 CFR 1.111
Reply to Office Action dated September 23, 2004
December 23, 2004

these amendments.

Claims 1-4, 6-8 and 14-19 were rejected under 35 USC 102(b) as being anticipated by Oshio et al. (U.S. Patent No. 6,274,890). This rejection is respectfully traversed in view of the amendments to the claims and the remarks below.

One of the uses of the present invention includes being used as a backlight in a liquid crystal display and this needs to be mounted on an external support member or optical member. Thus, excellent mounting efficiency is required. The present invention achieves this efficiency by providing at least one mounting surface on the light emitting side having a protrusion or recess as a means to achieve an easy positioning of the semiconductor device relative to the external support member or the optical member. It also achieves a secure connection to the external support or to the optical member. Various embodiments of the connections are shown in the figures and described in the specification.

By this amendment, the other rejected independent claims have been amended to define these features. Specifically, independent claim 1 has been amended to recite "a first surface disposed outside of the recess, a second surface extending

Amendment under 37 CFR 1.111
Reply to Office Action dated September 23, 2004
December 23, 2004

outwardly and being offset from the first surface and a third surface disposed between the first surface and the second surface, the third surface having a portion including a notch". These features are shown for example in Fig. 5 of the present invention.

Oshio et al. does not teach or suggest such a structure.

Oshio et al. disclose a semiconductor element 1'; a support member 10 having a recess for housing the semiconductor element 1', a support member 10 including lead electrodes 21 and 22 and a support part holding the lead electrodes 21 and 22 so that a surface of each of the lead electrodes 21 and 22 is exposed in a bottom of the recess. Oshio et al. does not disclose the first and second surfaces as claimed and does not show the third surface having a notch therein. Therefore it is respectfully submitted that claim 1 defines over the prior art of record.

Independent claim 2 has been amended to recite "a first surface disposed outside of the recess having a sealing member therein and a second surface disposed outside of and offset from the first surface". Claim 2 also recites that the second surface has at least one of a protrusion and a further recess disposed thereon. Oshio et al. does not teach or suggest such a

Amendment under 37 CFR 1.111
Reply to Office Action dated September 23, 2004
December 23, 2004

structure.

Oshio et al. does not show a second surface having a protrusion or recess therein as claimed in claim 2. Therefore it is respectfully submitted that claim 2 defines over the prior art of record.

Claims 6 and 7 have been amended to recite a first surface disposed outside of the recess and a second surface disposed outside of and offset from the first surface; and a sealing member disposed in the recess, and the sealing member has an emission surface below the first surface. Claim 7 further recites that the second surface has at least one of a protrusion and a further recess disposed thereon. Oshio et al. does not teach or suggest such a structure.

Oshio et al. does not show a sealing member having an emission surface below the first surface as claimed in claims 6 and 7. In Oshio et al. the emission surface is the same height as the first surface and it contacts the projection 9. Also, Oshio et al. does not show a second surface having a protrusion or recess therein as claimed in claim 7. Therefore it is respectfully submitted that claims 6 and 7 define over the prior art of record.

Amendment under 37 CFR 1.111
Reply to Office Action dated September 23, 2004
December 23, 2004

Claim 14 has been amended to recite "a first surface disposed outside of the recess having a sealing member therein and the first surface having at least one of a protrusion and a further recess disposed thereon". Oshio et al. does not show these features for the reasons set forth above. Therefore it is respectfully submitted that claim 14 defines over the prior art of record.

It is therefore submitted that independent claims 1, 2, 6, 7 and 14 and those claims dependent therefrom are all allowable over Oshio et al.

Specifically, newly added claims 20-31 depend directly or indirectly from claim 2. Also, newly added claims 32 and 33 depend from claim 6; claims 34 and 35 from claim 7; and claims 36 and 37 from claim 14, respectively. Since these dependent claims include all elements of their respective independent claim from which they depend, these dependent claims are also allowable over Oshio et al.

New independent claim 38 is directed to the embodiment of a semiconductor device shown in Fig. 18B. The features claimed in this claim are also not disclosed in Oshio et al. and Chiu et al.

Amendment under 37 CFR 1.111
Reply to Office Action dated September 23, 2004
December 23, 2004

Therefore, applicant respectfully submits that the application is now in condition for allowance and an action to this effect is respectfully requested.

If there are any questions or concerns regarding this application, the Examiner is requested to telephone the undersigned at the telephone number listed below.

Respectfully submitted,



Randolph A. Smith
Reg. No. 32,548

Date: December 23, 2004

SMITH PATENT OFFICE
1901 Pennsylvania Ave., N.W.
Suite 200
Washington, DC 20006-3433
Telephone: 202/530-5900
Facsimile: 202/530-5902
ASAKAWA122304